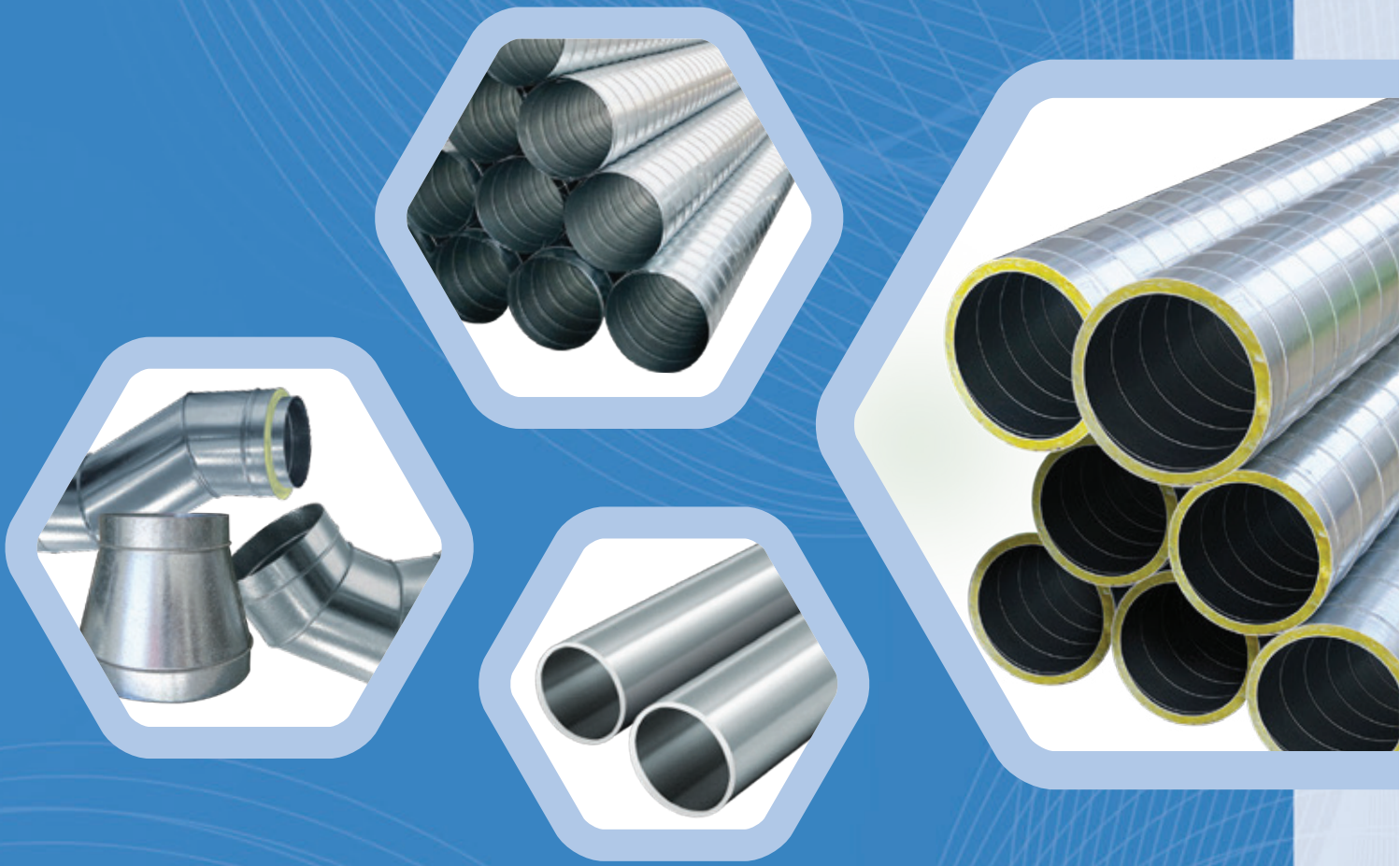
FMC
METAL FACTORY

شركة محمد عبدالرحمن فرحات للصناعة
Mohammad A. Farhat Co. For Industry



Round Ducts
Single & Double Wall

SISTEMA Certifications and Inspections ISO 9001:2015
IAS ACCREDITED Management Systems Certification Body
INTERNATIONAL ACCREDITATION FORUM IAF
International - Affiliate MEMBER SMACNA
amca INTERNATIONAL MEMBER

Assure Success with Customer Together

ABOUT US

FMC Metal Factory, founded in 2021 in the city of Jeddah, for its Excellence, Engineering, Professionalism, and Experience in the field of fabrication of HVAC duct and its Accessories. The company has been a forerunner in the Construction field with his vast experience, commitment, adoption of new technologies and challenges by emerging as one of a key player. It offers a wide range of services for Supply, Installation, Testing and Commissioning in HVAC field. The group is leading under the supreme guidance of Mr. Mohamed Abdul Rahman Farhat, who has a long life experience in the Saudi market.

Vision

Our ambition is to amplify the presence of FMC as a recognized company in the field of construction. We aspire to extent our professional services abroad in the coming years.

Mission

Form valuable long-term relationships with our clients and partners.

Manage large and complex projects.
Be a reliable company.

Compete successfully in the Construction market of the region with high efficiency, professionalism and honesty in order to maintain, our outstanding reputation.

Objective

Our aim is to enhance the lifestyle of the communities we serve through consistent, timely, efficient and added value delivery of engineered, innovative, and tailor-made technology solutions that never fails to exceed expectations

Commitment

Constantly strive to ensure that amidst all the projects exists a great deal of passion and commitment to provide quality services and to deliver clients satisfaction.

Maintain leadership in project management capability.

Provide an open and flexible approach towards the needs of our clients by listening and respecting their views and by being ahead of emerging trends.

Deliver superior value through our consistent implementation of advanced methods and state of the art solutions.

Our Team

FMC's work force is the main asset which represent and implement all projects in professional manors due to the on going training programs that we provide to our, head office employees, engineers, supervisors, technicians, drivers, labors and all of our working force whom reflect their professions on sites.

OUR PRODUCTS MAINTAINING THE HIGHEST INTERNATIONAL STANDARDS.

INTRODUCTION

FMC Matel factory equipped with latest technology to meet the growing demands with a prompt action by serving the best quality products, keen to establish themselves a pioneer in the market with the help of its well qualified engineers, skilled technicians and producing the best quality of products. FMC manufactures the ducts and it's accessories compliance to SMACNA and DW/144 construction schedule by adhering to internal QA/QC guidelines to serve with best of the best products. FMC Metal Factory active under ISO Certification for the scope of manufacturing Ducts works, Fittings & Related products which approved by the main Consultants and contracting companies.

FABRICATION PROCESS

1- Straight Spiral Ducts Fabrication:

Fabrication of Spiral Circular Ducts shall be based on Drawings provided by the client, by following below Procedures:

a) The job order will be encoded into the Spiral Duct Machine to produce the Straight Spiral Ducts as per diameters and lengths requested.

b) Connectors/Joints shall be according to the project specifications (Flanges/Coupling).

c) For Round **Double Wall** Duct, Liner will be applied between the walls, thickness and density for insulation will be as project specifications.

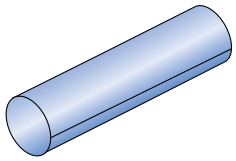
2- Fittings Fabrication:

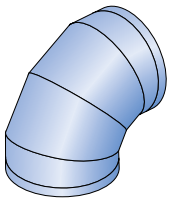
a) Individual Duct pieces will be nested on sheets to maximize sheet usage on the Laser machines.

b) The Job Order for the fittings will be sent to the Laser for cutting and marking the items.

d) From Laser Cutting machine the individual marked pieces will be removed and taken to the assembly area to produce the fittings (Elbow, Tee, Reducer, etc..).

e) After completion of fabrication, each item shall be cleaned properly; each item shall be labeled as per below figures.

3	**:: Supply Air**	
Project:	RESTAURANT	
Job Name: 500-62 - Customer		
Material & Gauge: Galvanised x 0.7	Item Area: 3.2 (sq m)	
Name: Round Pipe		
END 1: 500 (mm)	Swage-Pipe	
END 2: 500 (mm)	Swage-Pipe	
Length / Angle: 2000 (mm)	Insulation:	

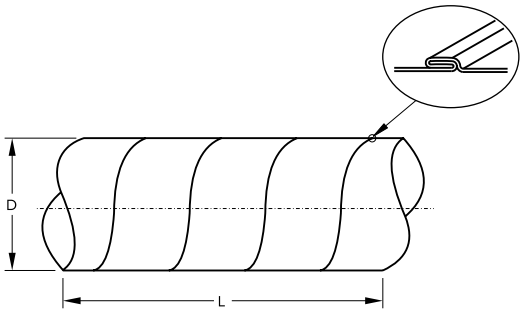
4	**:: Supply Air**	
Project:	RESTAURANT	
Job Name: 500-62 - Customer		
Material & Gauge: Galvanised x 0.7	Item Area: 1.1 (sq m)	
Name: Segment Bend		
END 1: 500 (mm)	Segment Lock	
END 2: 200 (mm)	None	
Length / Angle: 90	Insulation:	

Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

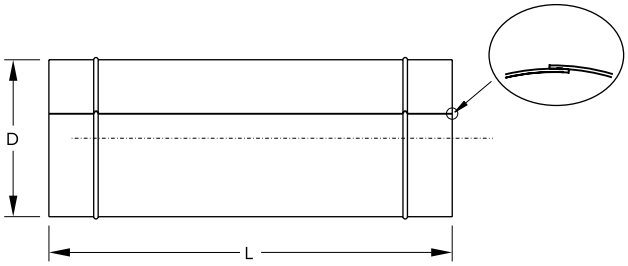
ROUND DUCT - SINGLE WALL

Spiral Duct



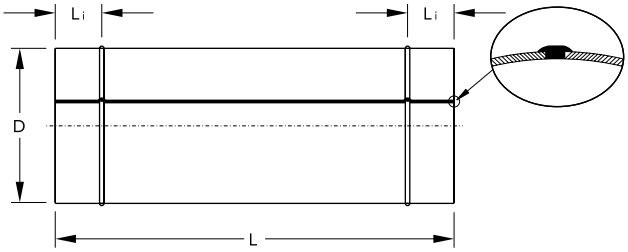
- Standard Length: 3000mm
  Custom Lengths Available
- To ± 10 in. wg (Galvanized)

Circular Straight Duct - Spot Welded Seam



- L: Standard Length: 1220mm

Circular Straight Duct - Full Welding Seam



- L: Standard Length: 1220mm
  Custom Lengths Available
- 1.0 mm Minimum Sheet Thickness
- To ± 10 in. wg (Galvanized)

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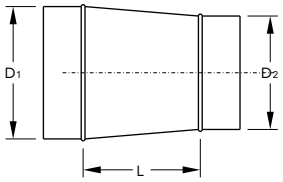
FITTINGS - SINGLE WALL

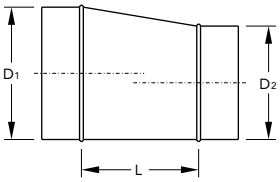
Concentric Reducer

- L= D_1 - D_2
- Minimum Length 100mm, Maximum Length 400mm

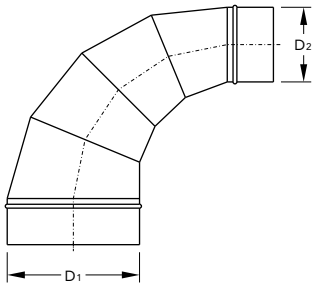


Eccentric Reducer

- L= D_1 - D_2
- Minimum Length 100mm, Maximum Length 400mm

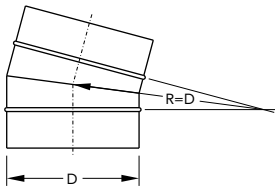


Reducing Segmented Bend



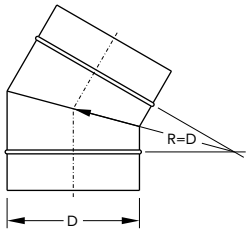
Segment Bend 15°

- Standard 2-Gore



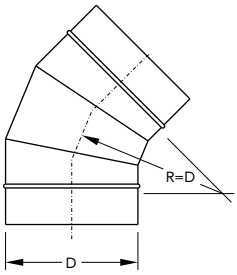
Segment Bend 30°

- Standard 2-Gore



Segment Bend 45°

- Standard 3-Gore



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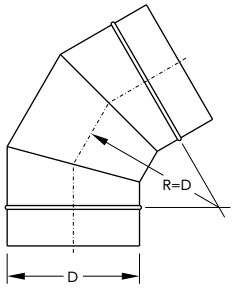
FITTINGS - SINGLE WALL

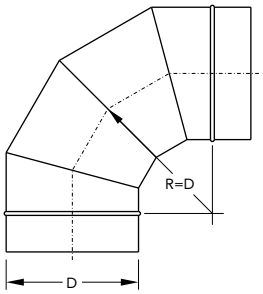
Segment Bend 60°

• Standard 3-Gore

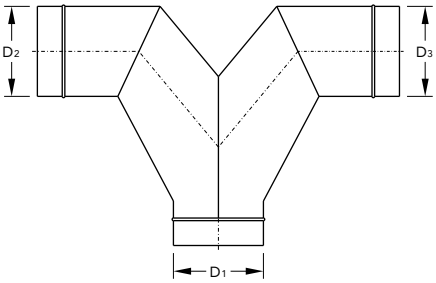


Segment Bend 90°

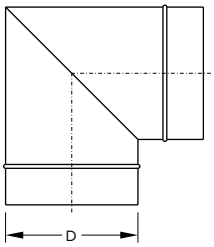
• Standard 4-Gore



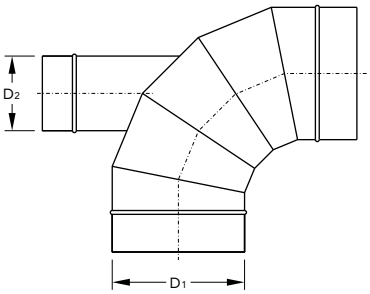
Twin Segment Bend



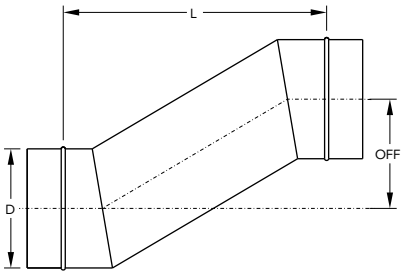
2 Segment Bend 90°



Bend 90° with Branch



Circular Offset



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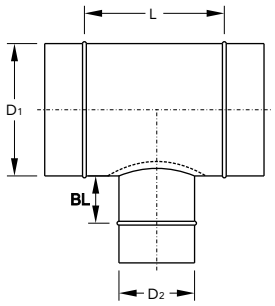
FITTINGS - SINGLE WALL

Centric Tee Piece

• L= D_2 + 100mm

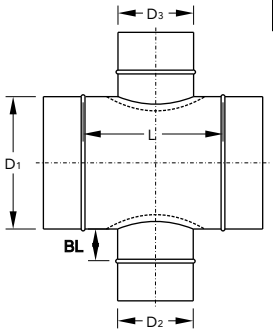


D_2	BL
100 to 650mm	50mm
710 to 1400mm	100mm

Centric Cross Tee Piece

• L= the longer of D_2 or D_3 + 100mm

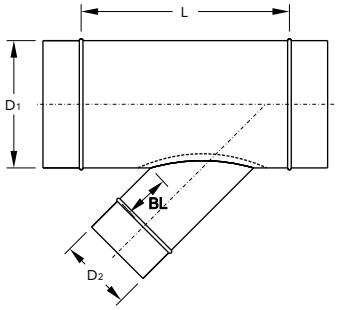
D_2 & D_3	BL
100 to 650mm	50mm
710 to 1400mm	100mm



Centric Tee Piece 45°

•L= D_2 x 1.5 + 100mm

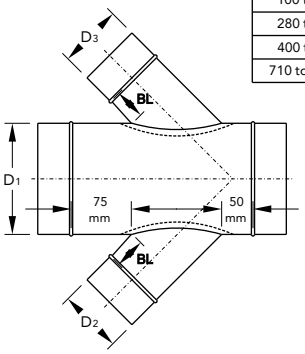
D_2	BL
100 to 250mm	50mm
280 to 355mm	75mm
400 to 650mm	100mm
710 to 1400mm	150mm



Centric Cross T - Piece 45°

• L= the longer of D_2 or D_3 x 1.5 + 100mm

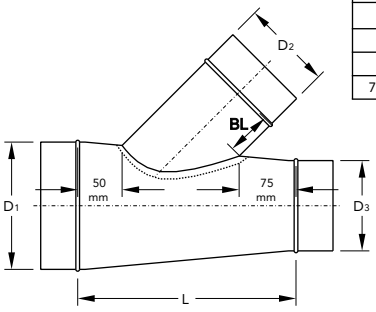
D_2 & D_3	BL
100 to 250mm	50mm
280 to 355mm	75mm
400 to 650mm	100mm
710 to 1400mm	150mm



Reducing Tee 45°

• L= D_2 x 1.5 + 100mm

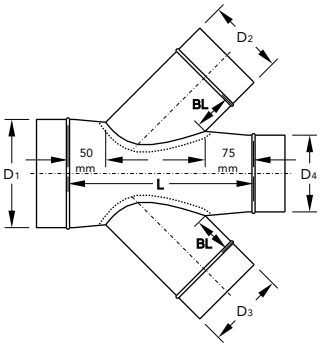
D_2	BL
100 to 250mm	50mm
280 to 355mm	75mm
400 to 650mm	100mm
710 to 1400mm	150mm



Reducing Cross Tee 45°

• L= the longer of D_2 or D_3 x 1.5 + 100mm

D_2 & D_3	BL
100 to 250mm	50mm
280 to 355mm	75mm
400 to 650mm	100mm
710 to 1400mm	150mm



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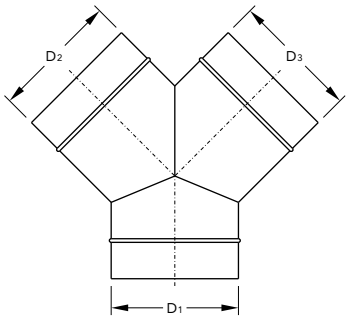
FITTINGS - SINGLE WALL

Y - Tee

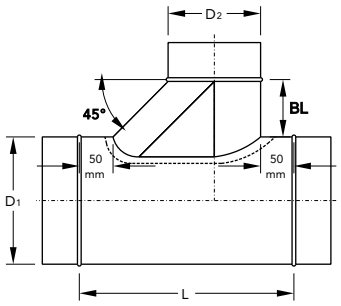
- 30° ,45° and 60°available
- $D_1 = D_2 = D_3$



Shoe Tee - Offset

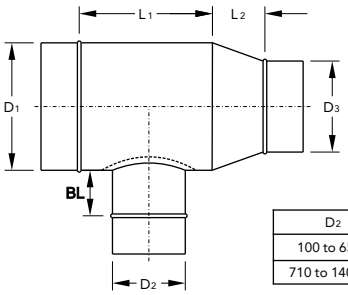
- $L = D_2 + BL + 100mm$

D2	BL
100 to 200mm	100mm
225 to 355mm	175mm
400 to 650mm	250mm
710 to 1400mm	300mm



Centric Tee Piece with Reducer

- $L_1 = D_2 + 150mm$
- $L_2 = D_1 - D_3$
- Minimum $L_2$100mm, Maximum $L_2$400mm

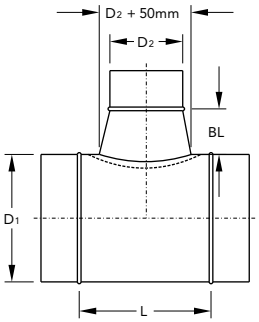


D2	BL
100 to 650mm	50mm
710 to 1400mm	100mm

Conical Tee

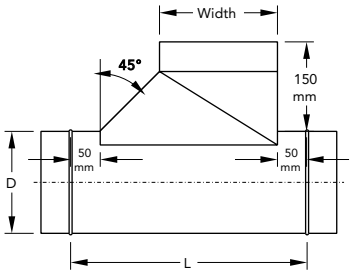
- $L_2 = D_2 + 150mm$

D2	BL
100 to 200mm	150mm
224 to 400mm	200mm
450 to 650mm	250mm
710 to 1400mm	300mm



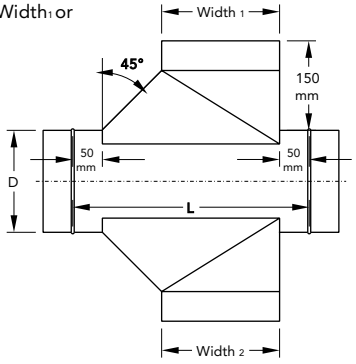
Rectangular Shoe with Pipe

- L=Width + 200mm



Rectangular Cross Shoe with Pipe

- L=the longer of $Width_1$ or $Width_2 + 200mm$



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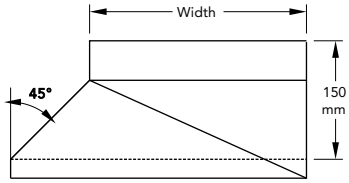
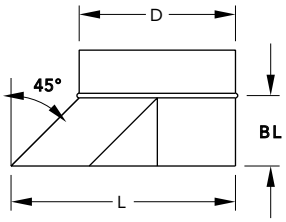
FITTINGS - SINGLE WALL

Rectangular Shoe on Pipe

- L=Width + 100mm

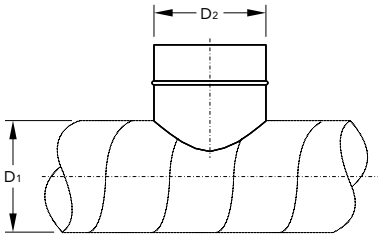


Circular Shoe on Flat

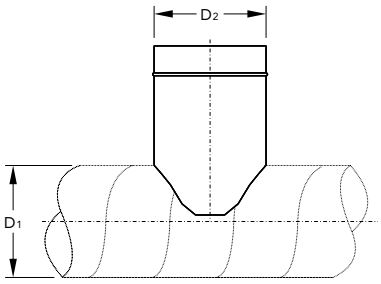


D	BL	L
100 to 200mm	75mm	+75mm
224 to 355mm	100mm	+100mm
400 to 650mm	125mm	+125mm
710 to 1400mm	150mm	+150mm

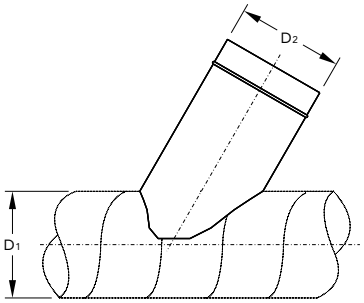
Collar Saddle



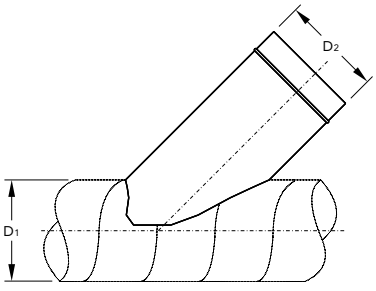
Branch 90°



Branch 60°



Branch 45°



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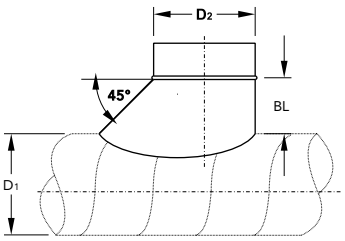
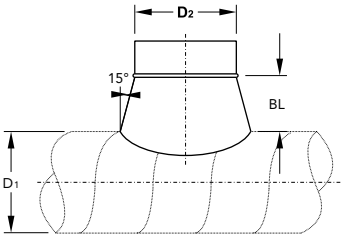
FITTINGS - SINGLE WALL

Circular Shoe on Pipe



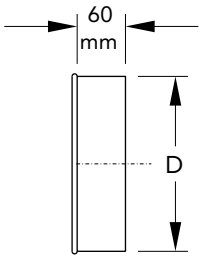
D2	BL
100 to 200mm	100mm
224 to 355mm	175mm
400 to 650mm	250mm
710 to 1400mm	300mm

Conical Branch on Pipe

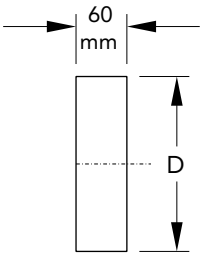


D2	BL
100 to 200mm	150mm
224 to 400mm	200mm
450 to 650mm	250mm
710 to 1400mm	300mm

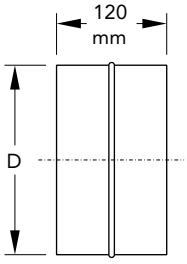
End Cap Tube (Male)



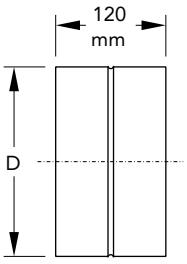
End Cap Fittings (Female)



Coupling Pipe



Coupling Fitting



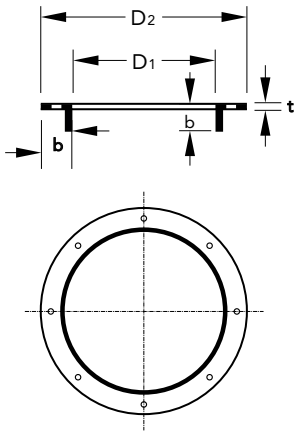
Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

FITTINGS - SINGLE WALL

Circular Angle Flange

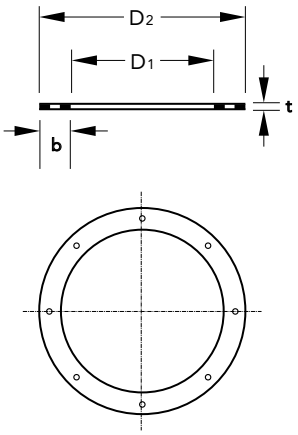
• D2 = D1 + b



D1	Bolts		b x b x t
	Dim.	N	mm
Up to 125	M6	4	25x25x3
150 to 250	M6	6	30x30x3
280 to 355	M8	8	40x40x4
400 to 500	M8	12	40x40x4
550 to 710	M10	16	40x40x5
750 to 1400	M10	24	50x50x5
Material: Hot Dip Galvanized Steel			

Circular Angle Flange

• D2 = D1 + b



D1	Bolts		b x t
	Dim.	N	mm
Up to 125	M6	4	25x3
150 to 250	M6	6	30x3
280 to 355	M8	8	40x4
400 to 500	M8	12	40x4
550 to 710	M10	16	40x5
750 to 1400	M10	24	50x5
Material: Hot Dip Galvanized Steel			

Customized Dimensions Available as per Customer Request

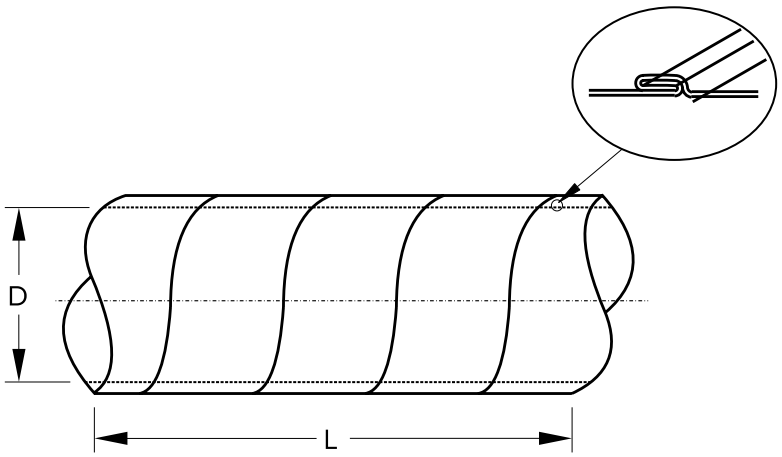
Materials Used for Ductworks:

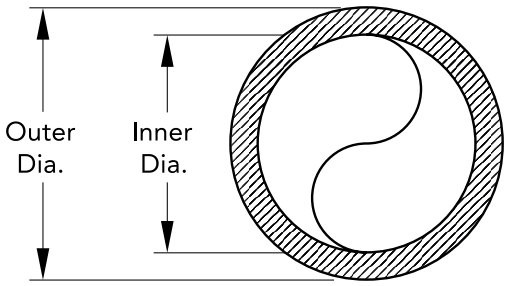
- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

Notes: 1- Circular Angle Flanges are made Hot Dip Galvanized Steel Angle.
2- Circular Flat Flanges are made Hot Dip Galvanized Steel Sheet.

ROUND DUCT - DOUBLE WALL

Spiral Duct





- Standard Length: 3000mm
  Custom Lengths Available
- To ± 10 in. wg (Galvanized)

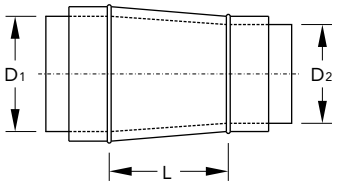
Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

FITTINGS - DOUBLE WALL

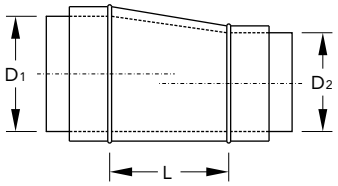
Concentric Reducer

- L= D_1 - D_2
- Minimum Length 100mm, Maximum Length 400mm

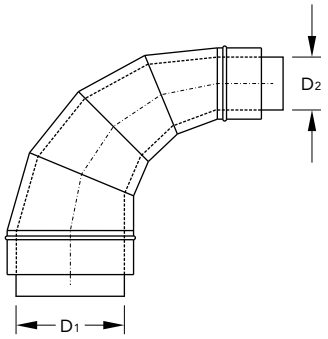


Eccentric Reducer

- L= D_1 - D_2
- Minimum Length 100mm, Maximum Length 400mm

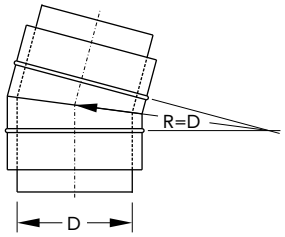


Reducing Segmented Bend



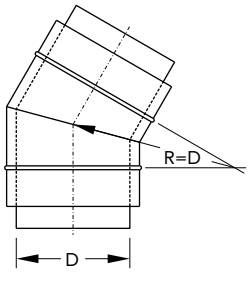
Segment Bend 15°

- Standard 2-Gore



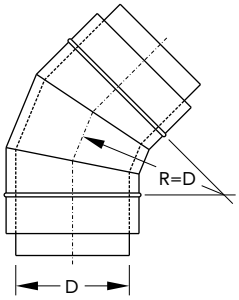
Segment Bend 30°

- Standard 2-Gore



Segment Bend 45°

- Standard 3-Gore



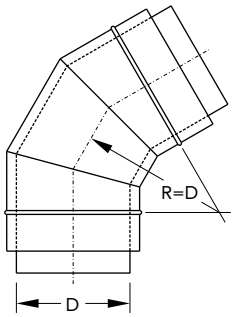
Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

FITTINGS - DOUBLE WALL

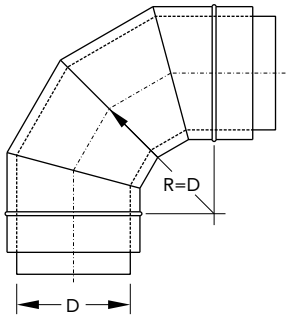
Segment Bend 60°

• Standard 3-Gore

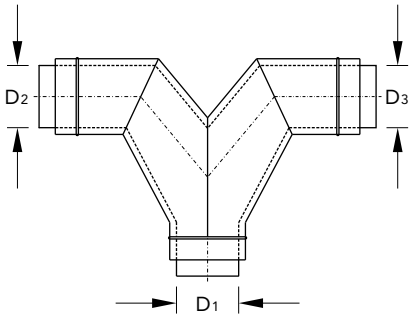


Segment Bend 90°

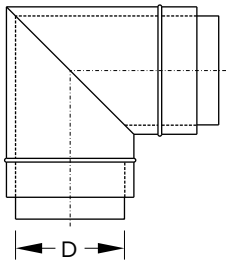
• Standard 4-Gore



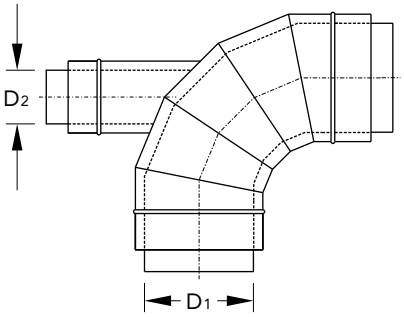
Twin Segment Bend



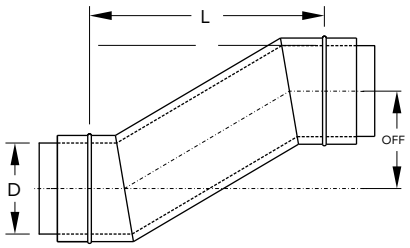
2 Segment Bend 90°



Bend 90° with Branch



Circular Offset



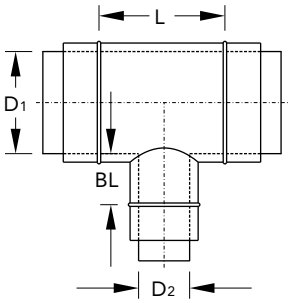
Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation or made Hot Dip Galvanized Steel Sheet, Flat Bar.

FITTINGS - DOUBLE WALL

Centric Tee Piece

• L= D_2 + 100mm

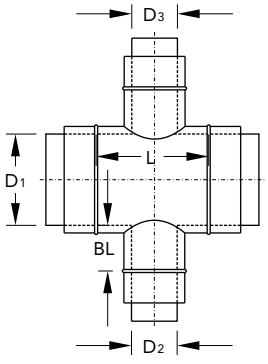


D_2	BL
100 to 650mm	100mm
710 to 1400mm	150mm

Centric Cross Tee Piece

• L= the longer of D_2 or D_3 + 100mm

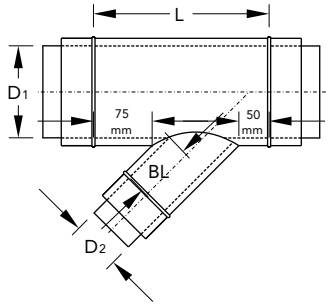
D_2 & D_3	BL
100 to 650mm	50mm
710 to 1400mm	100mm



Centric Tee Piece 45°

•L= D_2 x 1.5 + 100mm

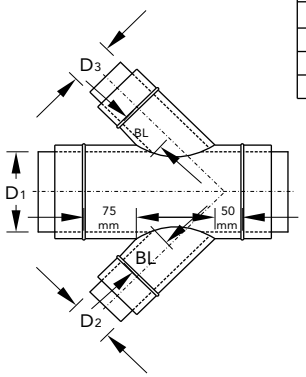
D_2	BL
100 to 250mm	100mm
280 to 355mm	125mm
400 to 650mm	150mm
710 to 1400mm	2000mm



Centric Cross T - Piece 45°

• L= the longer of D_2 or D_3 x 1.5 + 100mm

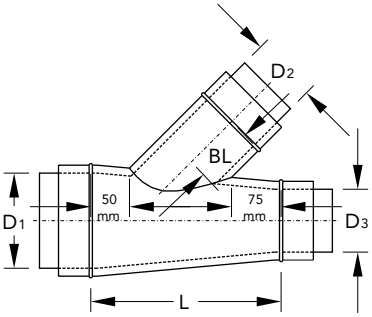
D_2 & D_3	BL
100 to 250mm	50mm
280 to 355mm	75mm
400 to 650mm	100mm
710 to 1400mm	150mm



Reducing Tee 45°

• L= D_2 x 1.5 + 100mm

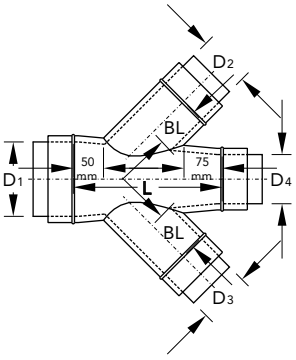
D_2	BL
100 to 250mm	100mm
280 to 355mm	125mm
400 to 650mm	150mm
710 to 1400mm	200mm



Reducing Cross Tee 45°

• L= the longer of D_2 or D_3 x 1.5 + 100mm

D_2 & D_3	BL
100 to 250mm	100mm
280 to 355mm	125mm
400 to 650mm	150mm
710 to 1400mm	200mm



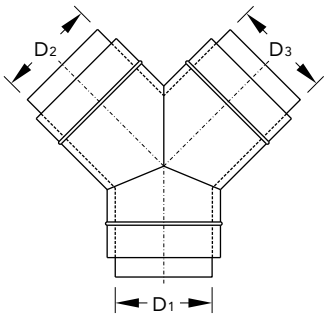
Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

FITTINGS - DOUBLE WALL

Y - Tee

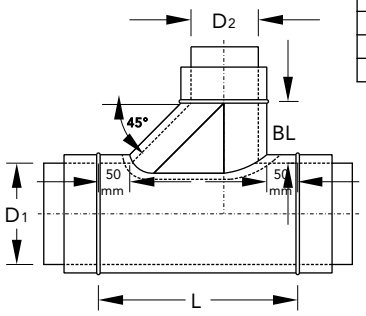
- 30° ,45° and 60°available
- $D_1 = D_2 = D_3$



Shoe Tee - Offset

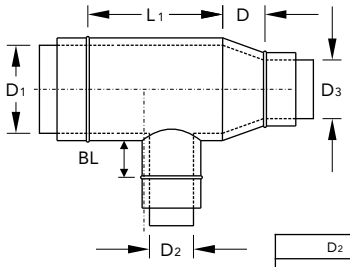
- $L = D_2 + BL + 100mm$

D_2	BL
100 to 200mm	150mm
225 to 355mm	255mm
400 to 650mm	300mm
710 to 1400mm	350mm



Centric Tee Piece with Reducer

- $L_1 = D_2 + 150mm$
- $L_2 = D_1 - D_3$
- Minimum $L_2$100mm, Maximum $L_2$400mm

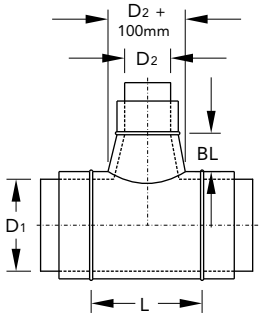


D_2	BL
100 to 650mm	100mm
710 to 1400mm	150mm

Conical Tee

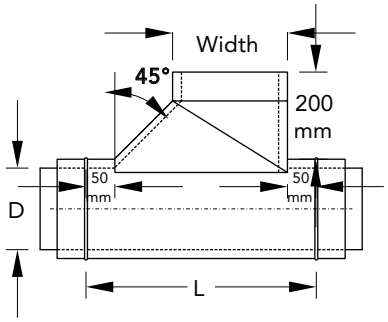
- $L_2 = D_2 + 150mm$

D_2	BL
100 to 200mm	150mm
224 to 400mm	200mm
450 to 650mm	250mm
710 to 1400mm	300mm



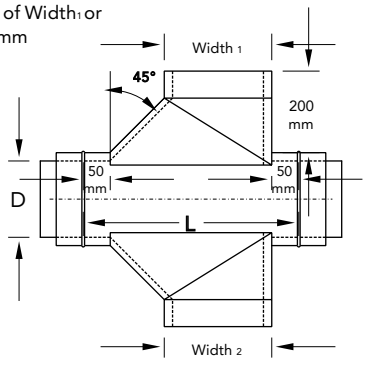
Rectangular Shoe with Pipe

- L=Width + 200mm



Rectangular Cross Shoe with Pipe

- L=the longer of $Width_1$ or $Width_2 + 200mm$



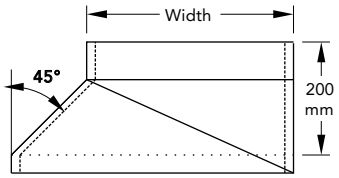
Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

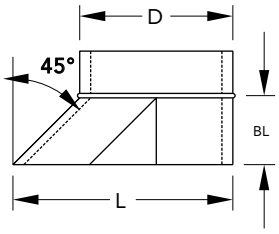
FITTINGS - DOUBLE WALL

Rectangular Shoe on Pipe

• L=Width + 100mm

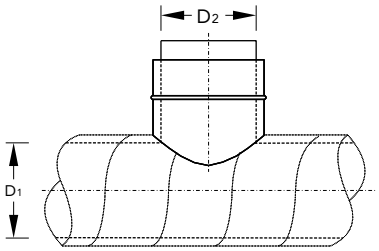


Circular Shoe on Flat

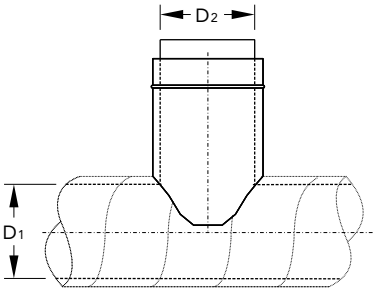


D	BL	L
100 to 200mm	125mm	+125mm
224 to 355mm	150mm	+150mm
400 to 650mm	175mm	+175mm
710 to 1400mm	200mm	+200mm

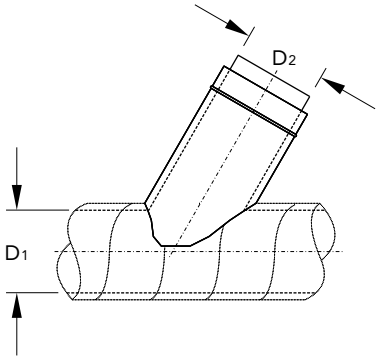
Collar Saddle



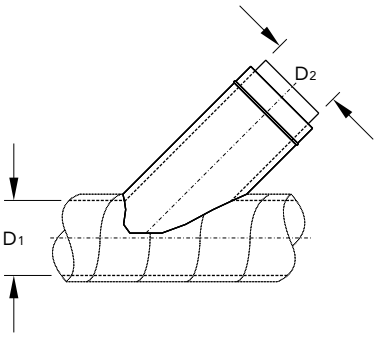
Branch 90°



Branch 60°



Branch 45°

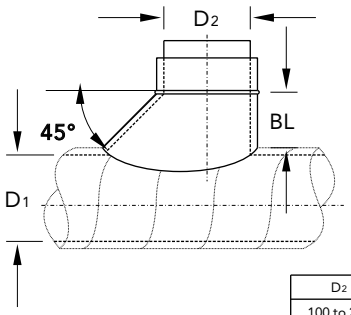


Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

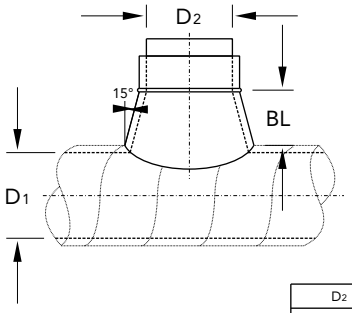
FITTINGS - DOUBLE WALL

Circular Shoe on Pipe



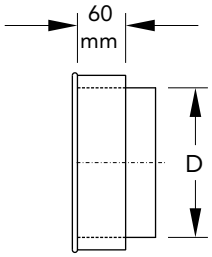
D2	BL
100 to 200mm	100mm
224 to 355mm	175mm
400 to 650mm	250mm
710 to 1400mm	300mm

Conical Branch on Pipe

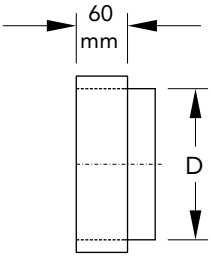


D2	BL
100 to 200mm	150mm
224 to 400mm	200mm
450 to 650mm	250mm
710 to 1400mm	300mm

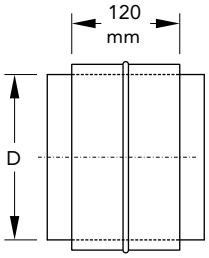
End Cap Tube (Male)



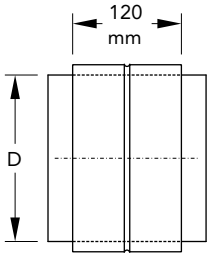
End Cap Fittings (Female)



Coupling Pipe



Coupling Fitting



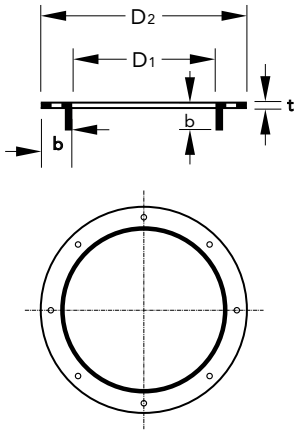
Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

FITTINGS - DOUBLE WALL

Circular Angle Flange

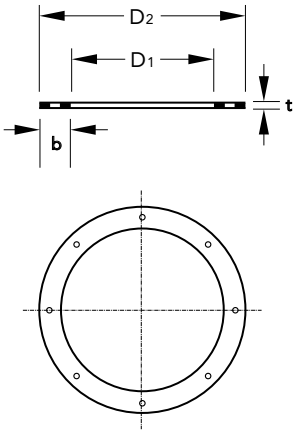
• D2 = D1 + b



D_1	Bolts		b x b x t
	Dim.	N	mm
Up to 125	M6	4	25x25x3
150 to 250	M6	6	30x30x3
280 to 355	M8	8	40x40x4
400 to 500	M8	12	40x40x4
550 to 710	M10	16	40x40x5
750 to 1400	M10	24	50x50x5
Material: Hot Dip Galvanized Steel			

Circular Angle Flange

• D2 = D1 + b



D_1	Bolts		b x t
	Dim.	N	mm
Up to 125	M6	4	25x3
150 to 250	M6	6	30x3
280 to 355	M8	8	40x4
400 to 500	M8	12	40x4
550 to 710	M10	16	40x5
750 to 1400	M10	24	50x5
Material: Hot Dip Galvanized Steel			

Customized Dimensions Available as per Customer Request

Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

Notes: 1- Circular Angle Flanges are made Hot Dip Galvanized Steel Angle.
2- Circular Flat Flanges are made Hot Dip Galvanized Steel Sheet.

SPIRAL DUCT WALL THICKNESS SCHEDULE

As per SMACNA Standard Third Edition 2015

Table - 01 Round Duct Gauge Unreinforced **Positive Pressure** To 2500 Pa

Diameter mm	Longitudinal Seam	Spiral Seam
100	0.55	0.55
150	0.55	0.55
200	0.55	0.55
250	0.55	0.55
300	0.55	0.55
350	0.55	0.55
400	0.55	0.55
450	0.55	0.55
500	0.70	0.55
550	0.70	0.55
600	0.70	0.55
750	0.85	0.70
900	0.85	0.70
1000	0.85	0.70
1200	1.00	0.85
1300	1.00	0.85
1500	1.00	0.85
1650	1.31	0.85
1800	1.31	1.00
1950	1.31	1.00
2100	1.31	1.00
2250	1.31	1.00
2400	1.31	1.00

Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

SPIRAL DUCT WALL THICKNESS SCHEDULE

As per SMACNA Standard Third Edition 2015

Table - 02 Round Duct Gauge for Spiral Seam Duct Under **Negative Pressure 500 Pa**

Neg. Pressure 500 Pa	Stiffener Spacing											
	Unstiff.		6.00 m		3.6 m		3.00 m		1.80 m		1.50 m	
Diameter (mm)	GA	R	GA	R	GA	R	GA	R	GA	R	GA	R
100	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
150	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
200	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
250	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
300	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
350	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
400	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
450	0.70	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
500	0.70	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
550	0.85	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
600	0.85	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
750	1.00	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
900	1.31	NR	0.70	A	0.55	A	0.55	A	0.55	A	0.55	A
1000	1.31	NR	0.70	A	0.55	A	0.55	A	0.55	A	0.55	A
1200	1.61	NR	0.85	B	0.70	A	0.55	A	0.55	A	0.55	A
1300	1.61	NR	0.85	B	0.70	B	0.70	A	0.55	A	0.55	A
1500	NIA	NR	0.85	B	0.70	B	0.70	B	0.55	A	0.55	A
1650	NIA	NR	0.85	C	0.70	B	0.70	B	0.55	B	0.55	A
1800	NIA	NR	1.00	C	0.85	B	0.70	B	0.70	B	0.55	B
1950	NIA	NR	1.00	D	0.85	C	0.85	C	0.70	B	0.55	B
2100	NIA	NR	1.00	E	0.85	C	0.85	C	0.70	B	0.70	B
2250	NIA	NR	1.00	E	0.85	D	0.85	C	0.70	B	0.70	B
2400	NIA	NR	1.00	E	0.85	E	0.85	D	0.70	C	0.70	B

NOTES:

a. NIA -Not Applicable
b. NR - Not Required
c. R - Reinforcement (stiffener) Class

Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

SPIRAL DUCT WALL THICKNESS SCHEDULE

As per SMACNA Standard Third Edition 2015

Table - 03 Round Duct Gauge for Spiral Seam Duct Under **Negative Pressure 1000 Pa**

Neg. Pressure 1000 Pa	Stiffener Spacing											
	Unstiff.		6.00 m		3.6 m		3.00 m		1.80 m		1.50 m	
Diameter (mm)	GA	R	GA	R	GA	R	GA	R	GA	R	GA	R
100	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
150	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
200	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
250	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
300	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
350	0.70	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
400	0.70	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
450	0.85	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
500	0.85	NR	0.70	A	0.55	A	0.55	A	0.55	A	0.55	A
550	1.00	NR	0.70	A	0.55	A	0.55	A	0.55	A	0.55	A
600	1.00	NR	0.70	A	0.55	A	0.55	A	0.55	A	0.55	A
750	1.31	NR	0.85	A	0.70	A	0.55	A	0.55	A	0.55	A
900	1.61	NR	0.85	B	0.70	A	0.70	A	0.55	A	0.55	A
1000	1.61	NR	0.85	B	0.85	B	0.70	A	0.55	A	0.55	A
1200	NIA	NR	1.00	B	0.85	B	0.85	B	0.70	A	0.55	A
1300	NIA	NR	1.00	c	0.85	B	0.85	B	0.70	B	0.70	A
1500	NIA	NR	1.00	D	0.85	c	0.85	B	0.70	B	0.70	B
1650	NIA	NR	1.31	E	1.00	c	0.85	c	0.70	B	0.70	B
1800	NIA	NR	1.31	E	1.00	D	1.00	c	0.85	B	0.70	B
1950	NIA	NR	1.31	E	1.00	E	1.00	D	0.85	c	0.85	c
2100	NIA	NR	1.31	F	1.00	E	1.00	E	0.85	c	0.85	c
2250	NIA	NR	1.31	G	1.31	E	1.00	E	0.85	D	0.85	c
2400	NIA	NR	1.61	G	1.31	F	1.00	E	0.85	E	0.85	D

NOTES:

a. NIA -Not Applicable
b. NR - Not Required
c. R - Reinforcement (stiffener) Class

Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

SPIRAL DUCT WALL THICKNESS SCHEDULE

As per SMACNA Standard Third Edition 2015

Table - 04 Round Duct Gauge for Spiral Seam Duct Under **Negative Pressure 1500 Pa**

Neg. Presure 1500 Pa	Stiffener Spacing											
	Unstiff.		6.00 m		3.6 m		3.00 m		1.80 m		1.50 m	
Diameter (mm)	GA	R	GA	R	GA	R	GA	R	GA	R	GA	R
100	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
150	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
200	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
250	0.55	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
300	0.70	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
350	0.70	NR	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A
400	0.85	NR	0.70	A	0.55	A	0.55	A	0.55	A	0.55	A
450	0.85	NR	0.70	A	0.55	A	0.55	A	0.55	A	0.55	A
500	1.00	NR	0.70	A	0.55	A	0.55	A	0.55	A	0.55	A
550	1.00	NR	0.70	A	0.70	A	0.55	A	0.55	A	0.55	A
600	1.31	NR	0.85	A	0.70	A	0.70	A	0.55	A	0.55	A
750	1.31	NR	0.85	A	0.70	A	0.70	A	0.55	A	0.55	A
900	1.61	NR	1.00	B	0.85	B	0.85	A	0.70	A	0.55	A
1000	NIA	NR	1.00	B	0.85	B	0.85	B	0.70	A	0.70	A
1200	NIA	NR	1.31	c	1.00	B	0.85	B	0.70	B	0.70	B
1300	NIA	NR	1.31	D	1.00	c	1.00	c	0.85	B	0.70	B
1500	NIA	NR	1.31	E	1.00	c	1.00	c	0.85	B	0.85	B
1650	NIA	NR	1.31	E	1.31	E	1.00	D	0.85	c	0.85	B
1800	NIA	NR	1.31	F	1.31	E	1.00	E	0.85	c	0.85	c
1950	NIA	NR	1.61	G	1.31	E	1.31	E	1.00	D	0.85	c
2100	NIA	NR	1.61	G	1.31	F	1.31	E	1.00	E	0.85	D
2250	NIA	NR	1.61	G	1.31	G	1.31	F	1.00	E	1.00	E
2400	NIA	NR	1.61	G	1.31	G	1.31	G	1.00	E	1.00	E

Table 3-12M Min. Required Gage for Spiral Seam Duct Under Neg. Pressure

NOTES:

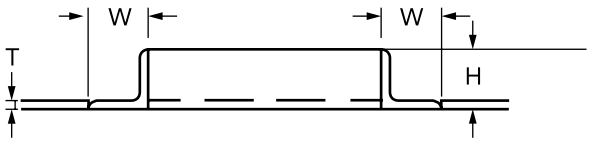
a. NIA -Not Applicable
b. NR - Not Required
c. R - Reinforcement (stiffener) Class

Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

SPIRAL DUCT REINFORCEMENT

As per SMACNA Standard Third Edition 2015



Angle Rings

ROUND DUCT REINFORCEMENT

Rainforcement Class	Size W x H x T (mm)
A	25 x 25 x 3.2
B	31.8 x 31.8 x 4.8
C	38.1 x 38.1 x 4.8
D	38.1 x 38.1 x 6.4
E	51 x 51 x 4.8
F	51 x 51 x 6.4
G	76 x 76 x 6.4

Angle Ring Size

Duct Dia. (mm)	Number of Attachments
150 and under	4
300 and under	6
450 and under	8
750 and under	12
1300 and under	16
1950 and under	20
2400 and under	24

Ring Attachment Schedule

NOTES :

a. Rings may be attached to the duct wall using screws, rivets, or tack welds.
b. Companion Flanges used for reinforcement shall be:

Duct Dia. (mm)	Flange Selection
up to 225	25 x 25 x 3.2*
250–300	31.8 x 31.8 x 3.2*
301–601	38.1 x 38.1 x 4.8
650-1200	5l x 5l x 4.8
1201-1500	63.5 x 63.5 x 4.8
1501-2400	76 x 76 x 6.4

Companion Flange Joints Used As Reinforcement

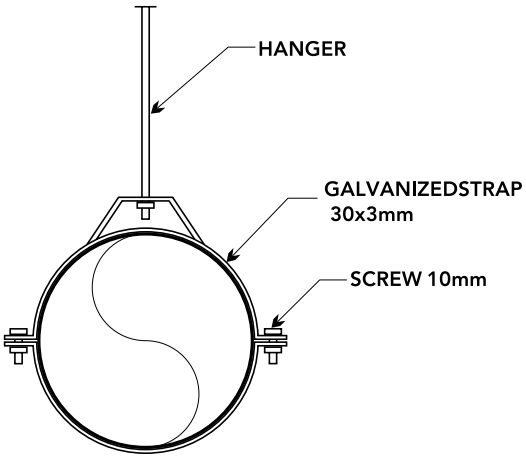
*Standard rings in 3.21 mm are an acceptable slightly heavier alternative to the specified 3.2 mm thickness rings.

Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation.
- **Stainless Steel** : (Optional) Complying with ASTM A240M / A480M, Grade 304, 304L, 316 & 316L.

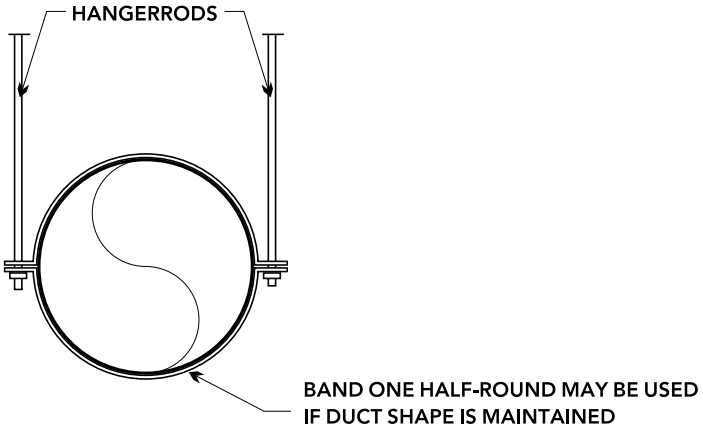
DUCT SUPPORTS

Single Rod



Double Rod

HANGERS MUST NOT DEFORM DUCT SHAPE



Materials Used for Ductworks:

- **Galvanized Steel** : (Standard) L.F.Q. Complying with ASTM A653 and Having G90 Coating Designation. or made Hot Dip Galvanized Steel Sheet, Flat Bar.

APPENDIX A

Galvanaized Sheet Thickness Tolerances

Gage	Thickness in Inches			Weight				Thickness in Millimeters		
	Min.	Max.	Nom.	Min lb/sf	Nom. lb/sf	Max. lb/sf	Nom. kg/m2	Min.	Max.	Nom.
33	.0060	.0120	.0090	.2409	.376	.486		.1524	.3048	.2286
32	.0104	.0164	.0134	.4204	.563	.665		.2642	.4166	.3404
31	.0112	.0172	.0142	.4531	.594	.698		.2845	.4369	.3607
30	.0127	.0187	.0157	.5143	.656	.759	3.20	.3188	.4783	.3988
29	.0142	.020	.0172	.5755	.719	.820		.3569	.5169	.4369
28	.0157	.0217	.0187	.6367	.781	.881	3.81	.3950	.5550	.4750
27	.0172	.0232	.0202	.6979	.844	.943		.4331	.5931	.5131
26	.0187	.0247	.0217	.7591	.906	1.004	4.42	.4712	.6312	.5512
25	.0217	.0287	.0247	.8407		1.167		.5274	.7274	.6274
24	.0236	.0316	.0276	.9590	1.156	1.285	5.64	.6010	.8010	.7010
23	.0266	.0346	.0306	1.0814		1.408		6772	.8772	.7772
22	.0296	.0376	.0336	1.2038	1.406	1.530	6.86	.7534	.9534	.8534
21	.0326	.0406	.0336	1.3263		1.653		.8296	1.0296	.9296
20	.0356	.0436	.0396	1.4486	1.656	1.775	8.08	.906	1.106	1.006
19	.0406	.0506	.0456	1.6526		2.061		1.028	1.288	1.158
18	.0466	.0566	.0516	1.8974	2.156	2.305	10.52	1.181	1.441	1.311
17	.0525	.0625	.0575	2.1381		2.546		1.331	1.591	1.461
16	.0575	.0695	.0635	2.342	2.656	2.832	12.96	1.463	1.763	1.613
15	.0650	.0770	.0710	2.6481		3.138		1.653	1.953	1.803
14	.0705	.0865	.0785	2.8725	3.281	3.525	16.01	1.784	2.204	1.994
13	.0854	.1014	.0934	3.4804		4.133		2.162	2.5823	2.372
12	.0994	.1174	.1084	4.0516	4.531	4.786	22.11	2.523	2.983	2.753
11	.1143	.1323	.1233	4.6505		5.394		2.902	3.362	3.132
10	.1292	.1472	.1382	5.2675	5.781	6.002	28.21	3.280	3.740	3.510
9	.1442	.1622	.1532	5.8795		6.614		3.661	4.121	3.891
8	.1591	.1771	.1681	6.4874	6.875	7.222		4.040	4.500	4.270

NOTES:

a. Based on ASTM A924/924M-94, Standard Specification for General Requirements for Sheet Steel, Metallic Coated by the Hot-Dip Pro-cess (formerly ASTMA525); and ASTMA653/A653M-94, Standard Specification for Sheet Steel, Zinc-Coat (Galvanized) or Zinc-Iron Alloy Coated (Galvanized) by the Hot-Dip Process.

b. Tolerances are valid for 48 in. and 60 in. wide coil and cut length stock - other dimensions apply to other sheet widths and to strip.

c. The lock forming grade of steel will conform to ASTM A653 (formerly ASTM A527).

d. The steel producing industry recommends that steel be ordered by decimal thickness only. Thickness and zinc coating class can be sten-ciled on the sheet. The gage designation is retained for residual familiarity reference only.

e. Minimum weight in this table is based on the following computation:

Minimum sheet thickness minus 0.001 in. of G60 coating times 40.8 lb. per sf. per in. plus 0.0369 lb./sf of zinc. G90 stock would be comparably calculated from:

(t - .00153 in.) 40.8 ÷ 0.05564 = minimum weight.

However, scale weight may run 2% (or more) greater than theoretical weight. Actual weight may be near 40.82 lb. per sf per in.

f. G60 coating, per ASTM A653 and ASTM A90, has 0.60 oz/sf (triple spot test) total for two sides. 0.59 oz/sf of zinc equals 0.001 in. 1 oz is 0.0017 in. and is 305.15 g/m^2.

G90 coating is 0.90 oz/sf (triple spot test), or 0.00153 in. Magnetic gage measurement of zinc coating may have 15% error.

g. ASTM D2092, Practice for Preparation of Zinc-Coated Galvanized Steel Surfaces for Paint, includes mill phosphatizing.

h. ASTM A755 is the Specification for Sheet Steel, Metallic Coated by the Hot-Dip Process and Prepainted by the Coating Process for Exteri¬or Building Products. Other information is available from the National Coal Coaters Association, Philadelphia, PA.

i. Much chemical and atmospheric corrosion information is available from ASM International in Metals Park, Ohio and from NACE Interna-tional in Houston, TX.

A principle international standard is ISO 3575, Continuous Hot-Dip Process, Zinc-Coated Carbon Steel Sheet of Commercial, Lock Form-ing and Drawing Qualities.

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